

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter analyzes the potential environmental consequences that would result from implementation of the Proposed Action and the No Action Alternative. The analysis of environmental consequences for each resource potentially affected by exploration and interim development in JRPA are addressed in this section. Additionally, resource specific mitigation measures required by the BLM are outlined in this chapter. The chapter also addresses cumulative impacts that may result from past, present, and reasonably foreseeable future activities (RFFAs) within the JRPA.

An environmental consequence or impact is defined as a change or modification in the existing environmental conditions resulting from implementation of the Proposed Action. Impacts can result directly from the Proposed Action, or can be a secondary or indirect result of the project. Additionally, impacts can vary in the duration they affect the environment, they can be permanent or long lasting (long-term) or temporary (short-term).

Long-term impacts are changes to the affected environment occurring during construction or operation of the project that last longer than two years and potentially for the life or beyond the life of the project. Short-term impacts normally occur during the construction and start-up phase of the project. These impacts usually last two years or less and can be mitigated successively if proper management is applied.

4.2 GEOLOGY, MINERALS, AND PALEONTOLOGY

4.2.1 Alternative 1- Proposed Action

Use of cut and fill construction techniques to develop well locations, access roads, and facilities would alter existing topography. An approximate 145.05 acres of short-term and 57.7 acres of long-term impacts would be affected by surface-disturbing activities in the JRPA.

No major landslides or other geologic hazards have been mapped within the JRPA. By following prescribed procedures, construction would not be likely to activate landslides, mudslides, debris flows, or slumps. Seismic activity is low in the area, so the potential for an earthquake to damage project facilities is minimal.

Drilling the wells in the JRPA is expected to result in the discovery of additional Mesaverde coal CBNG resources. An economic discovery in the JRPA, in conjunction with other economic discoveries under the Interim Drilling Policy, could lead to full-scale development, which is currently being analyzed in the Atlantic Rim EIS. No other major mineral resources would be affected by the proposed project.

It is not anticipated that development of the project would affect any sensitive geologic resource area, such as paleontological sites. Although the surface-disturbing activities associated with the proposed project could disturb paleontological resources, the potential for recovery of important vertebrate fossils in the JRPA is considered low to moderate. Excavation associated with

development of access roads, well pads, gas and water pipelines, and related gas production and water disposal facilities could directly expose, damage, or destroy scientifically significant fossil resources. However, no occurrences of paleontological resources are documented in the JRPA. Mitigation measures discussed in Chapter 2 would protect potential paleontological resources that may be inadvertently uncovered during excavation.

4.2.2 No Action Alternative

Under the No Action alternative, ongoing natural gas production activities would be allowed to continue. However, no exploratory wells would be authorized in the JRPA.

4.3 AIR QUALITY

4.3.1 Alternative 1- Proposed Action

Minor air quality impacts may result from activities initiated in the JRPA. Emission sources connected to the JRPA would be particulate emissions from construction activities and road use, gas production, and vehicle emissions. However, the small number of exploratory wells and facilities present in the JRPA would generate only a small amount of air pollutants. Some temporary effects on air quality would likely occur in the immediate vicinity of the project, caused by particulate matter and exhaust from vehicles and equipment. These effects would be local and would be dispersed by prevailing winds. Temporary increases in dust may also occur during the construction phase of the project. These effects on air quality would be minimized through dust abatement practices.

Prior to wells going into operation, the proponents would be required to file an application with the WDEQ for an air quality permit for oil and gas production facilities under Section 21 of the Wyoming Air Quality Standards and Regulations.

Air emissions would occur from construction and production of gas wells within the JRPA. Emissions from construction would include PM₁₀, SO₂, NO_x, CO, and volatile organic compounds (VOCs) from ground clearing, use of heavy equipment, drilling, and well completion, as well as from construction of access roads. Emissions from construction are temporary and would not contribute significant emissions to the project area and region.

Production emissions of NO_x, CO, VOCs, and hazardous air pollutants (HAPs) (specifically formaldehyde) would result primarily from operation of compressor engines. Estimated impacts to air quality assumed that the average potential emission rate of NO_x from the compressor engines would be approximately 2 grams per horsepower-hour (g/hp-hr) of operation. This rate reflects emission control levels that have already been required in similar applications. The emissions generated from operation of the compressors would contain minimal amounts of sulfur dioxide and particulate matter. Production emissions from the compressor engines would occur over the life of the project.

Pollutant emissions from construction and operation of natural gas fields near the JRPA have been most recently analyzed by the BLM in the Desolation Flats EIS. This study conducted detailed air quality modeling for 592 natural gas wells being planned for the project. The results of the study indicated that no adverse impacts would occur to air quality as a result of the

specific Proposed Action. However, the study did determine the project emissions combined with other regional emission sources would contribute to far-field visibility reduction within regionally designated Class 1 areas. Additionally, localized increases in criteria pollutants would occur as a result of the project. None of these increases would raise concentrations close to federal and state standards for these pollutants.

The emissions associated with this project would be similar to other natural gas projects in Wyoming, but due to the size of the project (only 24 wells); emissions would be on a much smaller scale. Based on the low emissions, no ambient air quality standards would be violated and no significant impacts to air quality would occur as a result of the project. However, JRPA emissions would contribute to regional emissions that contribute to far-field visibility reduction in Class 1 and II areas. However, this contribution would be negligible when compared with large regional emission sources. Additional air quality studies are needed to determine the contribution of southwest Wyoming natural gas operations to regional air quality issues.

4.3.2 No Action Alternative

Under the No Action alternative, no new gas wells would be installed in the JRPA. No new emission sources would occur in the JRPA.

4.4 SOILS

4.4.1 Alternative 1- Proposed Action

The proposed construction and operation of wells and facilities could affect the productivity of soils in the JRPA by:

- Removing existing vegetation cover;
- Redistributing or removing all or part of the soil profile;
- Compacting soils;
- Exposing soil to accelerated wind and water erosion;
- Potentially covering adjacent soils and drainages with sediments;
- Exposing the soil to noxious and invasive weed infestation; and
- Potential damage to sensitive biological soil crusts.

Project activities would reduce soil productivity within and immediately adjacent to the proposed areas of disturbance. The effects of these activities on soil productivity have been evaluated based on their duration, magnitude, and intensity. Both long-term and short-term effects on soil productivity would occur under the Proposed Action. Approximately 145.05 acres would be affected in the short term (2 years or less) and 57.7 acres would be affected in the long term (greater than 2 years).

Vegetation and soil would be removed from well pads, compressor pads, discharge facilities, pipelines, roads, and other facilities. This soil and vegetation removal may result in erosion, as most of the soils present in the JRPA do exhibit the potential for moderate to severe erosion.

As a result of these activities, the productivity of soils could decline due to:

- Reduced soil microbial activity and soil fertility;
- Interruption of soil nutrient and organic matter from vegetation;
- Impaired water infiltration from soil compaction;
- Mixing of soil horizons and soils of differing chemistry/composition;
- Damage to sensitive biological crusts; and
- Top soil loss

The intensity of these effects would vary according to the type and location of disturbance, development and production activities, use of mitigation measures, and the length of disturbance prior to reclamation.

To address these soil productivity issues, the proponents have committed to using the BMPs described in Chapter 2.

Following the drilling, testing activities, and the construction of facilities, the disturbed areas not required for production of natural gas would be reclaimed to BLM standards. Facility areas and roads would be regraded to blend the disturbed area into the surrounding topography. Regraded areas and redistributed soil would be scarified to alleviate compaction, and seeded to prevent wind and water erosion. Measures to control erosion, runoff and sedimentation during operations and reclamation also are described in Chapter 2.

Biological soil crusts are very sensitive and easily damaged by off-road vehicle use. The use of vehicles off designated roads will be severely limited. This measure should ensure that minimal damage will occur to biological soil crusts potentially present in the JRPA.

Overall impacts to soil resources in the JRPA are anticipated to be minimal based on the following evaluation:

- Small area of disturbance;
- Use of proper construction and reclamation techniques; and
- Implementation of the measures described in Chapter 2.

4.4.2 No Action Alternative

Under the No Action alternative, none of the proposed activities will occur. No new disturbance of soils from oil and gas exploration will occur.

4.5 WATER RESOURCES

4.5.1 Alternative 1- Proposed Action

No significant effects on groundwater or surface water would be anticipated as a result of the project with the use of proper construction techniques, drilling practices, proper operating procedures, and employing the mitigation measures described in Chapter 2.

Groundwater would be removed from the coal seam aquifers within the Allen Ridge, Pine Ridge, and Almond Formations, members of the Upper Cretaceous Mesaverde Group. These producing formations range in depth from 1,952 feet to 5,900 feet. There is no current practical use for water in these coal formations due to drilling and management costs, the high level of TDS, and the availability of higher quality water from the shallower aquifers.

These targeted coal seams are classified as confined to semi-confined aquifers because they are bounded by confining layers that consist of impervious to semi-pervious layers of shale and siltstone. Hydraulic connection between the coal seams and any aquifer stratigraphically above or below the coal seams is limited. Confined, or artesian, aquifer conditions of this type indicate an effective seal above and below the aquifer. However, lowering the hydraulic head in the coal seam aquifers by removing water may induce a slight leakage through the semi-pervious shale layers into the pumped aquifer. Because of the extremely low hydraulic conductivity of the confining layers and the limited number of new gas wells proposed (16), enhanced leakage from an aquifer stratigraphically above or below the affected coal seams would be minimal.

Eight permitted water wells are located within one mile of the JRPA (WSEO 04). One of these wells is utilized as a domestic source of water, with the rest permitted for stock watering. The wells range in depth between 4 and 300 feet. Three of these wells are located within the inferred circle of influence (within a half-mile radius) of the proposed production wells. It is possible that this project could minimally lower water levels within these three wells located within the inferred circle of influence, although this potential is extremely unlikely. These wells are located much higher than the targeted coal seam aquifers. Thus, utilizing the deeper producing formations would not impact these shallower, economically important aquifers. Additionally, potential effects on water wells would be minimized by the mitigation measures described in Chapter 2.

The exploratory wells would produce water that would be disposed of in three deep injection wells. Depth of the injection wells, which would be completed in the Cherokee or Deep Creek sands, is expected to be between 3,800 and 4,600 feet. The produced water that would be injected in these wells is of higher quality than groundwater in these formations. The only effect on the injection horizons would consist of an increase in the hydraulic head emanating from the injection well, which would dissipate with distance away from the well bore. In terms of water quantity and quality, the effect of the Proposed Action on the injection horizon would be minimal.

The JRPA has one existing deep injection well that is utilizing Cherokee and Deep Creek Sandstone and has been permitted by the WOGCC. This groundwater has been tested to evaluate its suitability for disposal. The results showed this groundwater to be of lower quality

than the produced water targeted for disposal in the well. Maximum pressure requirements to prevent initiation and propagation of fractures through overlying strata to any zones of fresh water have also been determined and would be regulated by the State of Wyoming. The other two wells will also have permits prepared and submitted to the WOGCC. It is expected that water quality and fracture pressure limits will be similar to the existing well.

Because water produced would be injected, no surface waters of the state would be affected by the management of produced water. In addition, all of the wells are located in the Great Divide Basin and have no known connectivity to the Colorado or North Platte Rivers. This eliminates the potential for issues relating to depletion of these rivers. All water disposal plans would be permitted with the state agency that regulates the facilities, including but not limited to the WOGCC or WDEQ.

Produced water would be collected in a buried polyethylene flowline (pipeline) for transport to an injection well. To keep surface disturbance to a minimum, ditches would combine as many pipelines as possible (water, electricity, and gas). BMPs would be used to control erosion and divert overland flows away from the facility. Centrifugal pumps, reciprocating pumps, filter systems, and tanks at the disposal facility would be used to remove solids from the water stream and to pump the water at pressures sufficient to allow downhole disposal. If it is not possible to safely inject the volume of produced water into the proposed injection wells, some or all of the exploratory wells would be shut in temporarily while alternative plans are developed and approved. These alternative plans would include additional injection wells.

Information about the groundwater system in the JRPA would be obtained in two ways: first, by monitoring the quality of produced water; second, by monitoring the volume of water produced over time during testing. This information also would be used to quantify impacts during the interim drilling phase of this project for use in the preparation of the Atlantic Rim EIS and evaluating future field development.

All produced water is to be injected, with only small amounts of produced water provided to livestock or wildlife in self-contained tanks that would not discharge to surface drainages, the quality or quantity of surface water would not be affected directly by this use. The Proponents would implement BMPs to ensure that produced water is not spilled and that it would not come in contact with surface waters in the JRPA.

Potential effects on surface water resources would include increased surface water runoff and off-site sedimentation caused by soil disturbance, impairment to surface water quality, and changes in stream channel morphology caused by construction and road/pipeline crossings. Effects on surface water resources would depend on:

- The proximity of the disturbance to a drainage channel,
- The aspect and gradient of the slope,
- The degree and area of soil disturbance,

- Characteristics of the soil, duration of construction, and
- Timely implementation and success or failure of mitigation measures.

Increases in sedimentation that would occur as a result of the project would be minimal, because construction and operation would comply with measures described in Chapter 2. Potential impacts from construction would likely be greatest in the short-term and would decrease in time as a result of stabilization, reclamation, and revegetation. Construction disturbance would not be uniformly distributed across the JRPA, but instead would be concentrated near drill locations, access roads, and pipelines.

Water for use in drilling the wells would be obtained from existing wells completed in the coal seams of the Mesaverde Group. Approximately 700 barrels of water (almost 30,000 gallons) would be needed to drill each well. The actual volume of water used in drilling operations would depend on the depth of the well and any losses that might occur during drilling.

4.5.2 No Action Alternative

Under the No Action alternative, the proposed natural gas development would not occur. No new impacts to surface or ground water would occur as a result of natural gas exploration in the JRPA.

4.6 VEGETATION, WETLANDS, AND INVASIVE WEEDS

4.6.1 Proposed Action

Implementation of the project would result in the loss of natural vegetation in terms of cover and species composition in areas where well sites, facilities, and access roads would be constructed. An estimated 191.1 acres would temporarily be affected by surface disturbance associated with drilling and testing activities. Topsoil would be stockpiled, and reclaimed areas would be revegetated with site-specific seed mixes approved by the BLM to avoid permanent loss of species diversity and vegetative cover. Should the exploratory wells be productive, the surface areas required for production facilities would not be reclaimed until production ends, which could be up to 20 years. An estimated 57.7 acres could be affected by production facilities and roads over the long-term.

The Wyoming big sagebrush plant community type that would be disturbed during this project is commonly found across southwest Wyoming. The short-term or long-term loss of this plant community acreage in the JRPA would not alter the overall area or regional abundance and quality of these habitats. A total of 3,910 acres of this plant community is found in the JRPA. The long-term impacts of approximately 57.7 acres represent 1.5 percent of this plant community in the project area.

In general, the duration and effects on vegetation in the JRPA would depend on the time required for natural succession to return disturbed areas to pre-disturbance conditions of diversity (both species and structural). In addition, the success of mitigation (seeding) would be influenced by climatic and soil conditions.

Surface disturbance could affect vegetation directly and indirectly by removal of existing vegetation and by introducing invasive weeds. Weedy species often thrive on disturbed sites such as road ROWs, and out-compete more desirable plant species. No existing patches of invasive weeds were identified in the JRPA. The potential for weeds to occur will increase with construction activities occurring in the JRPA. Utilizing proper BLM approved reseeding mixtures will help mitigate the potential for noxious weed invasion on disturbed sites. Additionally, monitoring of disturbed sites would be required to identify any weed invasion.

No threatened or endangered plant species are expected to occur in the JRPA because of a lack of suitable habitat. Therefore, development of the project is not expected to directly affect federally listed plant species.

The occurrence of sensitive plant species is likely limited on the JRPA due to a lack of suitable habitat for most of the species. None of the sensitive plant species discussed in Chapter 3 has known occurrences within the JRPA (WYNDD 2003). Given the low likelihood that sensitive plant species occur on the JRPA and the small amount of disturbance associated with the Proposed Action, no impacts to sensitive plant species are expected.

Minor impacts to wetlands or riparian areas are anticipated, given that most of the disturbance will occur outside the Fillmore Creek and Separation Creek watersheds. However, a proposed access road would cross Fillmore Creek and potentially disturb riparian/wetland habitat. Impacts to this habitat would be less than a third of an acre. These impacts would be mitigated through use of BMPs and proper low water road crossing construction. Additionally, the pipeline ROW will cross Separation Creek at two locations. These stream crossings will be trenched and result in some temporary disturbance to riparian vegetation. Impacts resulting from these stream crossings would be less than a third of an acre. However, the stream banks will be repaired and revegetated upon installation of the pipeline.

4.6.2 No Action Alternative

Under the No Action Alternative, no new natural gas impacts to vegetation or wetlands will occur. Additionally, no new disturbances will occur that could allow noxious weeds infestation to occur in the JRPA.

4.7 RANGE RESOURCES AND OTHER LAND USES

4.7.1 Proposed Action

Anticipated effects on range resources associated with the project are limited to a minimal long-term loss of 57.7 acres of forage and associated AUMs, an increased potential for collisions between livestock and vehicles, and an increased potential for the spread of noxious and invasive weed species (previously discussed above under the section on Vegetation, Wetlands, and Noxious Weeds).

Livestock grazing would continue during drilling and interim development. Forage in the JRPA would be reduced slightly during drilling and field development and would be restored as soon as practical. Areas used for roads, production equipment, and ancillary facilities would remain disturbed throughout the productive life of the field. The increased traffic during the drilling and

field development phases would correspondingly increase the potential for collisions between livestock and vehicles.

The average stocking rate for the Fillmore Allotment is 5.75 acres per AUM. The project would result in a short-term (145.05 acres of short-term disturbance) loss of forage associated with almost- 25 AUMs in the allotment. The long-term (57.7 acres of long-term disturbance) forage loss will eliminate approximately 10 AUMs.

Reclamation may increase forage production and availability in the short-term, since sagebrush would be removed and reseeded with native grass species. This would be beneficial to grazing species such as big game and cattle.

4.7.2 No Action Alternative

Under the No Action alternative, none of the proposed natural gas activities would occur in the JRPA. Loss of rangeland and AUM's due to this development would not occur. However, beneficial results of this activity (increases in grasses) for rangeland dependent livestock and big game would also not occur.

4.8 WILDLIFE AND FISHERIES

4.8.1 Proposed Action

The proposed development would disturb approximately 191.1 acres of general wildlife habitat during the development phase. Approximately 57.7 acres of long-term disturbance would remain following reclamation for the life of the project. Analysis of potential impacts of the proposed development upon wildlife assumes development of the wells, roads, and other facilities in the approximate locations identified in Figure 2-1.

During the production phase, the unused portion of well sites and pipelines would be reclaimed. Following completion of production operations (life of the project is estimated at 10-20 years), the well field and ancillary facilities would be reclaimed and abandoned. Well pads would be removed and the areas revegetated with seed mixes approved by the BLM, some of which would be specifically designed to enhance wildlife use. The duration of impacts to vegetation would depend, in part, on the success of mitigation and reclamation efforts. Additionally, another extremely important factor is the time needed for natural succession to return revegetated areas to predisturbance conditions. Grasses and forbs are expected to become established within the first several years following reclamation; however, much more time would be required to achieve reestablishment of shrub communities. Consequently, disturbance of shrub communities would result in a long-term loss of those habitats.

In addition to the direct loss of habitat due to construction of well pads, roads, and pipelines, disturbances from human activity and traffic would lower wildlife utilization of habitat immediately adjacent to these areas. Species that are sensitive to indirect human disturbance (noise and visual disturbance) would be impacted most. Habitat effectiveness of these areas would be lowest during the construction phase when human activities are more extensive and localized. Disturbance would be reduced during the production phase of operations and some animals may become accustomed to equipment and facilities in the gas field and may once again

use habitats adjacent to disturbance areas, while other animals may move to other areas outside the disturbance area.

General Wildlife

The direct project disturbance of wildlife habitat in the JRPA and outside the project boundaries would reduce habitat availability and effectiveness for a variety of common small mammals, birds and their predators. The initial phases of surface disturbance would result in some direct mortality to small mammals and the displacement of songbirds from construction sites. In addition, a slight increase in mortality from increased vehicle use of roads in the project area is expected. Quantification of these losses is not possible; however, the impact is likely to be low over the short-term. Due to the relatively high production potential of these species and the relatively small amount of habitat disturbed, small mammal and songbird populations would rebound to a level slightly below pre-disturbance levels following reclamation of pipelines, unused portions of roads, well pads, and wells that are no longer productive. No long-term impacts to populations of small mammals and songbirds are expected.

Big Game

Impacts to big game wildlife species would include direct loss of habitat and forage, and increased disturbance from drilling, construction, and maintenance operations. Construction activities associated with well pads and roads can reduce use of surrounding habitat by big game. Although these impacted sites reduce foraging due to the direct loss of native vegetation from ground disturbance, there is an area surrounding these sites that tends not to be utilized due to increased human activity. This “zone” can extend up to a half mile from the developed area. Consequently, development impacts to wildlife can extend further offsite than the actual amount of ground disturbance.

Disturbance of elk during the parturition period and on winter range can increase stress and may influence species distribution (Hayden-Wing 1980, Morgantini and Hudson 1980). There may also be a potential for an increase in poaching and harassment of big game, particularly during winter. According to management directives in the RMP (USDI-BLM 1990), crucial big game winter ranges will be closed from November 15 - April 30; this closure of areas located in crucial big game winter ranges will reduce disturbance to wintering big game. This closure would also limit the potential for poaching and/or harassment of big game species wintering in the area.

The JRPA supports antelope throughout the year. Approximately 99.9 acres of pronghorn winter/yearlong range and 22 acres of spring/summer/fall range would be disturbed under the Proposed Action within the project boundary. Approximately 11.9 miles of the pipeline would be located within spring/summer/fall range, disturbing approximately 71.8 acres. The remainder of the pipeline would be located in winter/yearlong range, disturbing approximately 3 acres. Following reclamation, approximately 46.9 acres of winter/yearlong range (**0.02 % of the winter/yearlong range in the Baggs Herd Unit**) and 10.8 acres of spring/summer/fall range (**0.003% of spring/summer/fall range in the Baggs Herd Unit**) would remain disturbed for the life of the project. No pronghorn crucial winter range would be disturbed under the Proposed Action. Activities associated with the construction phase of the project would likely temporarily displace antelope, however, once construction is complete antelope would likely habituate and return to pre-disturbance activity patterns, while other animals may move to other areas outside

the disturbance area. Reeve (1984) found that pronghorn acclimated to increased traffic volumes and machinery as long as the traffic and machines moved in a predictable manner. In combination, the disturbance of pronghorn seasonal ranges and the potential for pronghorn displacement would reduce the quality of pronghorn habitat surrounding project facilities on the JRPA. The displacement of pronghorn and disturbance of habitats is considered a short-term impact because of the temporary nature of the displacement and the availability of comparable habitats in adjacent areas.

The JRPA supports mule deer year round. All of the JRPA is classified as mule deer winter/yearlong range. All of the proposed wells and developments within the JRPA would occur in mule deer winter/yearlong range for a total of 121.9 acres of disturbance under the Proposed Action. Approximately 1.75 miles of the pipeline would be located within mule deer spring/summer/fall range, disturbing approximately 10.6 acres. The remainder of the pipeline would be located within mule deer winter/yearlong range, disturbing approximately 64.2 acres. Following reclamation, approximately 57.7 acres of mule deer winter/yearlong range **(0.005% of the winter/yearlong habitat in the Baggs Herd Unit)** would remain disturbed within the JRPA for the life of the project. Activities associated with the construction phase of the project would likely temporarily displace mule deer, however, once construction is complete some of the mule deer would likely habituate and return to pre-disturbance activity patterns, while other animals may move to areas outside the disturbance area. In combination, the disturbance of mule deer seasonal ranges and the potential for mule deer displacement would reduce the quality of mule deer habitat surrounding project facilities on the JRPA. However, the potential displacement of mule deer and disturbance of habitats is considered a short-term impact because of the temporary nature of the displacement and the availability of comparable habitats in adjacent areas.

The JRPA supports elk during the winter months and the entire JRPA is classified as elk winter range or crucial winter range. None of the proposed development within the JRPA would occur within the small amount of crucial winter range found in the JRPA. All of the proposed wells and developments within the JRPA would occur in elk winter range for a total of 70.2 acres of disturbance under the Proposed Action. Approximately 0.27 miles of the pipeline would be located just within elk crucial winter range, disturbing approximately 1.6 acres. The remainder of the pipeline would be located within elk winter range, disturbing approximately 73.2 acres. Following reclamation, approximately 57.7 acres of elk winter range **(0.02 % of the winter range in the Sierra Madre Herd Unit)** would remain disturbed within the JRPA for the life of the project. In combination, the disturbance of elk seasonal ranges and the potential for elk displacement would reduce the quality of elk habitat surrounding project facilities on the JRPA. However, no significant adverse impacts upon the elk utilizing the project area are expected provided that mitigation measures contained in this document and the RMP are implemented.

Greater Sage-grouse

Suitable greater sage-grouse habitat is abundant on and around the JRPA and specific measures must be taken to avoid impacting this species. Greater sage-grouse are of special concern because populations throughout the west have been declining; they are listed as a BLM sensitive species, and have been petitioned for listing under the ESA. Under the Proposed Action, 191.1 acres of the Wyoming big sagebrush primary vegetation cover type would be disturbed during construction and 57.7 acres in the long-term. This amount of habitat disturbance is minimal (1.5

% long-term) considering the amount available in the project area. Greater sage-grouse may also avoid areas associated with development including roads, well pads, and pipelines. Greater sage-grouse may also be impacted by noise disturbance associated with human activity, traffic, compressor stations, and drilling operations. Resource specific mitigation measures for greater sage-grouse in this document would minimize the impacts to leks, nesting areas, and severe winter relief habitats are avoided or minimized. Ten active greater sage-grouse leks have been identified within two miles of the JRPA and the sales pipeline.

Construction activities within a two-mile radius of occupied leks would be restricted between March 1 and June 30 to provide protection for grouse during the egg-laying, incubation, and brood-rearing period. Exceptions may be granted by the BLM if they determine the activity has no impact on the species. Only one of the proposed wells on BLM surface (AR FED 1890 NW-4) was not located within potential greater sage-grouse nesting habitat. Approximately 1,509.7 acres of suitable nesting habitat were mapped on the BLM surface land within the JRPA. Nine of the proposed wells and 5.5 miles of road and gathering lines would be located within potential greater sage-grouse nesting habitat on BLM surface land. Together, the proposed wells, road and gathering lines would disturb approximately 65.9 acres of potential nesting habitat on BLM surface land within the JRPA. It is likely that the remaining proposed wells and access roads not located on BLM surface would be located within potential greater sage-grouse nesting habitat. If all avoidance and mitigation measures identified in this document, the RMP, and the Interim Drilling Policy are implemented, impacts to greater sage-grouse are expected to be minimal.

Raptors

The potential impacts of the Proposed Action on raptors are: (1) nest abandonment and/or reproductive failure caused by project related disturbance, (2) increased public access and subsequent human disturbance resulting from new road construction, and (3) small, temporary reductions in prey populations.

The primary potential impact to raptors from project activities is human disturbance during the nesting season (Feb 1 – July 31) that might result in reproductive failure. To minimize this potential, disturbance would not be allowed during the critical nesting season near active raptor nests. Seasonal timing restrictions within a “buffer zone” around nests to avoid disturbance to nesting raptors should reduce impact from construction activities. The BLM may attempt to relocate well pad facilities if they fall within 1200 feet of a ferruginous hawk nest and 825 feet of any other hawk species nest. Exceptions may be granted by the BLM if they determine the activity has no impact on the species. No active raptor nests were located on or within one mile of the JRPA during 2004 (HWA 2004). However, one inactive ferruginous hawk nest was found on the JRPA during a BLM onsite review in 2004. Two active raptor nests (one red-tailed hawk and one golden eagle) were located within one mile of the pipeline in 2004. Raptors may nest in currently unoccupied areas in the future and if active nests are located on the project area in future years, appropriate avoidance and mitigation measures would be taken to avoid significant impacts to breeding raptors.

Fish

No impacts to fish resources are expected since all of the proposed JRPA facilities are located within the Great Divide Basin.

4.8.1.1 Threatened, Endangered, and Proposed Wildlife, and Fish Species

Wildlife Species

In Wyoming, white-tailed prairie dog colonies provide essential habitat for black-footed ferrets. Ferrets depend almost exclusively on prairie dogs for food, and they depend upon prairie dog burrows for shelter, parturition, and raising young (Hillman and Clark 1980). The FWS, in coordination with the WYGFD have determined which prairie dog complexes have the potential to support wild populations of black-footed ferrets in the State of Wyoming. The JRPA is not located in one of those prairie dog complexes; therefore, surveys for black-footed ferrets were not required within the JRPA. The RFO does attempt to move all surface disturbing activities outside of prairie dog towns, since prairie dogs are on the Wyoming BLM State Sensitive Species List. The small white-tailed prairie dog town located in Section 6 is not expected to be disturbed given the current proposed location of wells and access roads.

Canada lynx are not expected to occur on the JRPA because of the lack of suitable habitat; however, there is the slight potential that lynx may migrate through the area. The proposed project is not expected to prevent potential lynx migration through the area.

Bald eagles typically build stick nests in the tops of large coniferous or deciduous trees along streams, rivers or lakes. This type of habitat is not present on the JRPA, and bald eagles are not known or expected to nest on the JRPA. Bald eagles may utilize the JRPA during winter months when big game species are more concentrated on winter ranges. However, the JRPA does not support concentrated use by bald eagles and bald eagle use of the JRPA is likely incidental. Bald eagles may feed on road-killed carrion in the general vicinity of the JRPA and workers should be educated about the danger of striking a bald eagle with a vehicle along the main highways and roads providing access to the JRPA. The Proposed Action is not expected to impact bald eagles provided that the avoidance and mitigation measures in this document, the RMP, and the Interim Drilling Policy are implemented.

4.8.1.2 Sensitive Wildlife and Fish Species

Wildlife Species

Of the sensitive species listed by the BLM for the RFO area, the species with the highest potential to occur on the JRPA are the white-tailed prairie dog, sage sparrow, Brewer's sparrow, sage thrasher, western burrowing owl, loggerhead shrike, greater sage-grouse (see discussion above), mountain plover, ferruginous hawk, and northern goshawk (see raptor section). The likelihood of the remaining sensitive species occurring on the JRPA is low; therefore, no impacts would occur to these species from the Proposed Action.

Burrowing owls are typically associated with prairie dog burrows. Burrowing owls may utilize the prairie dog town on the JRPA, however no disturbance is proposed to occur in the prairie dog

town; therefore, the proposed development is not expected to impact burrowing owls or white-tailed prairie dogs. The sage sparrow, Brewer's sparrow, sage thrasher, and loggerhead shrike are all associated with shrub-dominated habitats (primarily sagebrush and greasewood in the JRPA). Minimizing disturbance of these habitats would decrease any potential impacts to these species. However, human activity may temporarily displace these species from areas near the project facilities. Implementation of the Proposed Action is expected to have minor impacts upon these species due to the limited amount of habitat disturbance.

Although ideal mountain plover habitat does not occur in the project area, some areas of potential mountain plover habitat do occur. No mountain plovers were observed in the potential habitat areas during surveys conducted in 2001, 2002, and 2003. A portion of the potential mountain plover habitat along the pipeline and near Well #1890-NW-9, Well #1890 NE-18, and Well # 1990 SE-32 would be disturbed with implementation of the Proposed Action. Impacts to mountain plovers would be minimized by avoiding construction activities in potential plover nesting habitat during the nesting period from April 10 -July 10. The exact location of mountain plover nests may change annually, and mountain plover nest activity status and location must be kept current. For this reason, surveys for mountain plovers will be required if an exception to the mountain plover stipulation is requested within areas of potential habitat during the nesting season. These surveys would occur prior to any surface disturbance in those areas, and be in accordance with the current mountain plover survey protocol (USDI-FWS 2002). No impacts to mountain plovers are expected provided that avoidance and mitigation measures outlined in this document and the RMP are implemented.

In summary, no significant impacts upon sensitive wildlife species are expected provided that avoidance and mitigation measures in this document, the RMP, and the Interim Drilling Policy are followed.

Fish Species

No sensitive fish species occur within the JRPA.

4.8.2 No Action

Under the No Action alternative, the coordinated plan of development described under the Proposed Action would not be approved. No additional effects on wildlife and fish resources would be expected to occur if the proposed wells are not drilled.

4.9 RECREATION

4.9.1 Proposed Action

The interruption of hunting activities in the JRPA represents the only recreation impact in the JRPA. Project activities would result in a temporary displacement of some hunters, particularly during construction and drilling. Some hunters perceive these activities as displacing game species and creating an environment that detracts from the hunting experience. Displacement would be highest during the grouse, pronghorn, deer, and elk season, when the most hunters utilize the area. The proposed drilling schedule would limit displacement to one season. It is not known if outfitters utilizing the JRPA will move their operations to another location.

Some long-term displacement of hunters likely would occur as a result of the project. Human access and activity would increase under the project, especially with the improved and new access roads. Overall, effects on the recreation resource would be minimal because of the short-term nature of drilling and construction and concentrated locations of these activities.

4.9.2 No Action Alternative

Under the No Action alternative, no disturbance to hunting and other recreation would occur in the JRPA as a result of natural gas activity.

4.10 VISUAL RESOURCES

4.10.1 Proposed Action

The severity of visual impact within the BLM Visual Resource Management (VRM) rating system is related to the scenic quality, sensitivity level, and distance zone of the affected environment. The JRPA short-term and long-term visual impacts would be considered acceptable in this Class III area. The contrasts during construction would be seen by relatively few viewers and would be visible only for a short time.

Minor short-term impacts to visual resources associated with construction and drilling would include contrasts in line, color, and texture. These contrasts are associated with drilling rigs, construction equipment, facilities, roads, trailers, and the general industrial character of drilling. Additional impacts may occur from fugitive dust produced by construction and increased vehicle traffic.

Permanent wells and production facilities would remain after well drilling is completed. The presence of permanent facilities would create continued visual impacts over the long term. Mitigation measures described in Chapter 2 would decrease and minimize these visual impacts.

4.10.2 No Action Alternative

Under the No Action alternative, no new natural gas development impacts to visual resources would occur in the JRPA.

4.11 CULTURAL RESOURCES

4.11.1 Proposed Action

A Class III cultural resource survey has been conducted for all federal lands proposed to be disturbed, including well pads, new access roads, road upgrades, compressor and facilities sites, and pipelines.

Impacts to cultural resource sites in the JRPA will be mitigated by avoidance or data recovery. In certain circumstances, a combination of the two could be utilized to prevent impacts. Avoidance will usually consist of moving or realigning the site to avoid disturbing significant sites. Utilizing this mitigation measure is the preferred method to avoid impacts to cultural resource sites. If avoidance can not be accomplished, data collection will be utilized to recover and record the site artifacts and history.

A total of five cultural resource sites were identified in the Class III survey. None of these sites were eligible for the NRHP. Additionally, a viewshed analysis of the well pads and roads determined no affect to the Rawlins-Baggs Stage Road.

Surveys conducted for the project included 10 acres for each well pad and a 150 foot ROW for roads and pipelines (combined ROW). Potential damage to these sites would most likely occur from surface disturbance during construction. These surveys ensure that sites will be identified and no damage will occur from planned surface disturbing activities. Specific mitigation measures required by the BLM for cultural resources are identified in Chapter 2. Other mitigation measures initiated to protect cultural resources would be ensuring natural colors are utilized for facilities and roads. Additionally, utilizing road configurations that conform to the landscape would prevent impacts to cultural resources.

The Rawlins-Baggs Stage Road is located near the JRPA and is eligible for the NRHP. If it is determined the sales pipeline impacts this road, Section 106 consultation would be initiated between the BLM and the Wyoming State Historic Preservation Office. Mitigation measures such as decreasing the ROW width for the pipeline would be utilized to prevent impacts to this site.

Native American religious sites have not been previously identified in the area. The Class III survey did not identify any of these sites on the JRPA.

4.11.2 No Action Alternative

Under the No Action Alternative, no cultural resource sites would be potentially disturbed by new natural gas development in the JRPA.

4.12 SOCIOECONOMICS

4.12.1 Proposed Action

Socioeconomic impacts of the project would be largely positive. The project would enhance regional economic conditions and generate revenues from local, state, and federal government taxes and royalties. Most of the workforce would originate from personal located in southwestern Wyoming. The relatively small, short-term field development workforce would not create a local boom or increased demand for temporary housing or local government services.

Development and operation of the project would require goods and services from a variety of local and regional contractors and vendors. Expenditures by the Proponents for these goods and services, coupled with employee and contractor spending, would generate economic effects in Carbon County and southwest Wyoming. It is reasonable to assume that the direct and indirect economic benefits of the project would be positive.

4.12.1.1 Oil and Gas Activity in Carbon County

To date in 2004, 151 APDs have been issued for natural gas wells in Carbon County. The 16 new wells associated with the project would be approximately 11 percent of the current 2004 APD level for the county. This project will not result in a significant increase in natural gas

wells in Carbon County. However, if successful, this project may increase the likelihood that the ARPA will be developed.

4.12.1.2 Population Effects

This project will not result in a noticeable population increase in Carbon County. Most of the skills and services required for the project are available in the local labor pool, although the recent increase in oil and gas drilling in southwest Wyoming has absorbed much of the available work-force. The project would require 16 to 36 drilling and field development workers for a period of 2-3 months. Many of these workers will be from southwestern Wyoming.

Based on the relatively small workforce, and short-term nature of the drilling and field development phase of the project, area housing and businesses could accommodate the increase in activity resulting from the development of the project.

4.12.1.3 Temporary Demand for Housing

Existing housing in Rawlins and nearby communities could accommodate the relatively small demand for temporary housing during drilling and field development.

4.12.1.4 Law Enforcement and Emergency Response

The relatively small level of field development and operations personnel would be accommodated by existing law enforcement and emergency management resources.

4.12.1.5 Fiscal Effects

The federal government receives a 12.5 percent royalty on the fair market value of natural gas produced from federal leases. Half of these royalties would be returned to the State of Wyoming. The State of Wyoming collects a six percent severance tax on gas production, exempting federal royalties, production, and transportation costs. The state also collects a four percent sales tax on goods. Twenty eight percent of these funds are returned to the local county. These natural gas revenues represent a substantial funding source for the State of Wyoming and Carbon County.

If the productive life of each successful gas well in the project is 15 years and produces on average nearly 100 MCF per year of natural gas, which is sold (on average) for \$2.50 per MCF, the sales value of each well would be about 3.5 million over the life of the project. If 10 federal gas wells within the project were productive, the federal royalties would be approximately \$6 million. The severance tax collected by the State of Wyoming would be approximately \$2 million. These numbers are approximate, and are only intended to indicate the order of magnitude of possible fiscal effects.

4.12.2 No Action Alternative

Under the No Action alternative, no federal mineral royalties would be gathered and no additional socioeconomic effects would be expected to occur if the JRPA wells are not drilled.

4.13 TRANSPORTATION

4.13.1 Proposed Action

4.13.1.1 Federal and State Highways

The project would not significantly increase the volume of traffic on federal and state highways that provide access to the JRPA. Some minor increases would result from movement of project-related workers, equipment, and materials to and from the JRPA for drilling, field development, well service, field operations, and reclamation.

The only major federal highway near the project area is I-80, and this project should not result in any noticeable traffic increase on this highway.

Based on these relatively small traffic increases and short duration in traffic volume, the project would not result in a measurable increase in accident rates on federal and state highways. During the operations phase, the probability of an increase in accident rates that could be attributed to the project would be negligible.

4.13.1.2 County Roads

The project would increase traffic on the county roads that provide access to the JRPA. The relatively small, short-term increases in traffic are unlikely to result in significant deterioration of the roads or substantial increases in accidents. The primary effects of increased project traffic on county and BLM roads would be accelerated requirements for maintenance.

Increased traffic may raise the potential for accidents between vehicles and livestock. The potential for these accidents increases during calving and periods when cattle are moving to new ranges. To reduce the likelihood of this occurring, the Proponents should coordinate their development efforts with ranchers to prevent these accidents.

4.13.1.3 Internal Roads

The proponents would be responsible for constructing and maintaining new and improved roads within the JRPA. No fiscal impacts resulting from the development or maintenance of roads are anticipated for the BLM or Carbon County.

4.13.2 No Action Alternative

Under the No Action alternative, no additional roads would be constructed to access natural gas facilities. Additionally, traffic levels would remain at existing levels in the JRPA.

4.14 HEALTH AND SAFETY

4.14.1 Proposed Action

The Proposed Action would create a slightly higher level of risk to workers and visitors in the JRPA. An increase in traffic would raise the potential for accidents between gas workers, ranchers, and visitors (hunters etc.). Some other minimal risks are associated with oil and gas construction and operations, and firearm accidents, although this risk is extremely low.

4.14.1.1 Occupational Hazards

The statistical probability of injuries is low during the drilling and field development phase of the project, when a peak number of 36 workers may be employed.

The BLM, OSHA, United States Department of Transportation (USDOT), WOGCC, and WDEQ each regulate certain safety aspects of oil and gas development. Adherence to relevant safety regulations by the Proponents and enforcement by the agencies would reduce the probability of accidents. Additionally, in light of the remote nature of the JRPA and the relatively low use of these lands by others (primarily grazing permittees and hunters), occupational hazards associated with the project would mainly be limited to employees and contractors rather than the public.

4.14.1.2 Other Risks and Hazards

Risks to public health and safety are not expected to increase under the project. Impacts associated with sanitation or the materials used in CBNG development would be prevented or reduced by the mitigation measures described in Chapter 2.

The potential for firearms-related accidents would occur during hunting season. However, the substantial activity in the JRPA would encourage hunters to seek more isolated hunting units, reducing the potential for accidents.

The risk of fire in the JRPA could increase with the project, but would remain low. Fire is a potential impact associated with construction, industrial development, and the presence of fuels, storage tanks, natural gas pipelines, and gas production equipment. This small risk would be reduced further because facilities would be situated on pads and in locations that are graded and devoid of vegetation. In the event of a fire, property damage most likely would be limited to construction- or production-related equipment and rangeland resources. Fire suppression equipment, a no smoking policy, shutdown devices, and other safety measures typically incorporated into gas production also would minimize the risk of fire.

4.14.2 No Action Alternative

Under the No Action alternative, no new natural gas development would occur in the JRPA, resulting in no increase in safety issues in the area.

4.15 HAZARDOUS MATERIALS

4.15.1 Proposed Action

All project-related activities involving hazardous materials will be conducted in a manner that minimizes potential environmental impacts. Potential impacts associated with hazardous materials include human contact, inhalation or ingestion, and the effects of exposure, spills or accidental fires on soils, surface and groundwater resources and wildlife. No hazardous substance, as defined by CERCLA, will be used in the construction or drilling operations associated with these wells. No RCRA hazardous wastes will be generated by well-drilling operations.

The risk of human contact would be limited predominantly to the operator and contractor/subcontractor employees. Mitigation measures described in Chapter 2 would reduce the risk of human contact, spills and accidental fires, and provide protocols and employee training to deal with these events should they occur. Based on successful implementation of these plans and procedures, no significant impacts associated with hazardous materials would be anticipated. Any spills of oil, gas, or any potential hazardous substance will be reported immediately to the BLM, landowner, local authorities, and other responsible parties and will be mitigated immediately, as appropriate, through cleanup or removal to an approved disposal site.

4.15.2 No Action Alternative

Under the No Action alternative, no new natural gas wells would be drilled and no issues related to hazardous material would be encountered in the JRPA.

4.16 NOISE

4.16.1 Proposed Action

Noise associated with construction and natural gas production operations can cause disturbance that affects human safety (at extreme levels) or comfort and can modify animal behavior. Noise levels that exceed the 55-dBA maximum standards can occur at construction and production operations. Noise levels around a compressor engine contained in an enclosed building would be below 55-DBA at an estimated 600 feet from the compressor site (BLM 1999b). Construction-related impacts would be short-term (less than 2 years), lasting as long as construction was under way at well sites, access roads, pipelines, and other ancillary facilities such as compressor sites. Noise would be created over a longer term at the individual well sites as a result of production facilities.

With no human population living in or near the JRPA, little noise impact is expected from the project. However, some noise disturbance to livestock and wildlife may result from the project.

4.16.2 No Action Alternative

Under the No Action alternative, no noise impacts from new natural gas development would occur in the JRPA.

4.17 CUMULATIVE IMPACTS

Cumulative impacts consist of an impact that is created as a result of the combination of the project evaluated in this document together with other projects causing related impacts. These impacts occur when the incremental impact of the project, when combined with the effects of other past, present, and reasonably foreseeable future projects are cumulatively considered. This typically occurs when impacts compound or increase existing environmental problems in an Area of Influence (AOI). Depending on the resource, the AOI may be the project area or it could have a larger area of influence (Such as the ARPA).

Increasing natural gas development in the ARPA would create additional environmental impacts that could stress critical resources in the region. Energy development represents the only large scale activity in the ARPA that could be associated with increasing adverse resource impacts.

This discussion of cumulative impacts will focus on existing and future energy development in the ARPA.

The ARPA is approximately 40 miles long and consists of nine CBNG pods. Each pod can contain a maximum of 24 wells. The JRPA is being authorized under the Interim Drilling Policy which allows up to 200 wells to be drilled prior to completion of the Atlantic Rim EIS. Existing CBNG development currently authorized under this policy is located in the Sun Dog, Cow Creek, Blue Sky, Doty Mountain, and Red Rim sites. This represents a total of 120 CBNG wells currently authorized under the Interim Drilling Policy.

4.17.1 Geology, Minerals, and Paleontology

The AOI for geology, minerals, and paleontology would be the JRPA.

Existing, proposed, and reasonably foreseeable actions would not add or create additional geologic hazards such as landslides, mudslides, debris flows, or slumps.

Existing and proposed development of mineral resources consists of CBNG development in the JRPA. Cumulative impacts to geologic resources would be minimal and consist of some alteration to the surface topography. Standard project and site specific construction procedures would be required for all proposed development on federal lands.

Proposed development could potentially impact paleontological resources. Adherence to BLM requirements for the protection of this resource should mitigate any adverse impacts to fossils present in the project area. Potential location of these resources during construction would be a positive impact and may result in a scientifically significant discovery.

4.17.2 Air Quality

The AOI for air quality would encompass the ARPA and could extend to Class I or II wilderness areas located within 100 miles of the project. Cumulative impacts from emissions could affect an area well beyond the borders of the ARPA.

Existing and planned natural gas development in the ARPA would impact air quality through increased emissions associated with vehicles, machinery, and compressors. In addition, fugitive dust emissions would increase and would vary depending on traffic volumes. Cumulative impacts from the project would be similar to those analyzed in the Continental Divide/Wamsutter II EIS and the Desolation Flats EIS. As discussed in the air quality section, the modeling completed for the Desolation Flats EIS determined that air emissions would be below federal and state standards. Air emission impacts from the JRPA would be minimal in the immediate project vicinity, minimal effects in the near field, and would incrementally contribute to a reduced far field visibility effect.

Overall, this project would contribute minor emissions in the ARPA. However, when combined with the other ongoing or planned development in the ARPA, the emission levels would contribute to incremental regional emission increases.

4.17.3 Soils

The AOI for soils includes the JRPA, and includes all disturbances related to the construction and operation of wells, facilities, pipelines, and roads.

Cumulative impacts include effects on soil from planned exploration and development, completed facilities, and reasonably foreseeable activities. Minimal impacts to soils can be expected from these actions if all of the site specific mitigation and reclamation procedures are followed. Most of the disturbance to soils would be short-term and would not contribute to loss or degradation of this resource in the future. If properly reclaimed, soil stability and productivity should improve over the life of this project.

4.17.4 Water Resources

The AOI for groundwater resources would be the Great Divide Basin. CBNG development in the ARPA could impact groundwater resources in the basin through withdrawal of groundwater and infiltration of this water if surface discharge is utilized. The water in the producing formations is high in salt content and is located at depths that make it economically unfeasible to utilize for commercial purposes. However, this project is going to dispose of produced water through three injection wells planned for the project. This water would be injected into these wells for the life of the project. No cumulative impacts to Mesaverde Group groundwater resources would occur during this project.

Since the project is located in the Great Divide Basin, all groundwater flow is contained in the basin. With no connection to the Colorado River or North Platte River, ground water connectivity to this surface water is not an issue for this project or others planned in the basin.

Overall, no cumulative impacts to groundwater resources are expected from this project.

The AOI for surface water resources would be limited to Fillmore and Separation Creek watersheds and associated stock reservoirs. Cumulative impacts to surface water would occur primarily during construction and would decrease as reclamation efforts stabilize soils. The surface disturbance from natural gas development in these watersheds could contribute to increased sediment loading. Increased sediment entering the stock ponds would continue to lower their water holding capacity. This may require monitoring and increased use of BMPs to lower sediment loads entering these reservoirs. Overall protection of these surface waters would be maintained through use of BMPs stipulated by the BLM. CBNG development would be limited to the 24 wells in the JRPA and would not include additional development beyond that number.

No cumulative effects to surface water resources are expected from this Proposed Action.

4.17.5 Vegetation, Wetlands, and Invasive Weeds

The AOI for vegetation (including wetlands and weeds) consists of the JRPA. Cumulative impacts for vegetation in the JRPA would consist of past and proposed CBNG development, reasonably foreseeable activities, and vegetation management connected with range improvements.

Potential cumulative impacts resulting from these activities would primarily consist of loss of vegetative cover and potential weed infestation. Overall, the loss of vegetation is minimal and would be mitigated by reclamation. The total long-term loss of vegetative cover from this CBNG development is approximately 57.7 acres. This loss would not contribute to a significant decrease in vegetative cover in the JRPA.

The potential for weed infestation does exist from the proposed development. However, following the BLM stipulations for weed infestation would minimize this threat.

No sensitive (threatened, endangered, candidate, proposed, or sensitive) plant habitat is known to occur in the project area.

Overall, only minimal cumulative impacts to vegetation are expected from this project.

4.17.6 Range Resources and Other Land Uses

The AOI for range resources is the 42,335 acre Fillmore Allotment.

Cumulative impacts resulting from proposed CBNG development would consist of the loss of approximately 57.7 acres of the allotment. This minimal reduction would not significantly impact the allotment. Additionally, the reseeded of disturbed sites would convert sagebrush habitat to native grass habitat. This would be a short-term beneficial range resource impact resulting from the Proposed Action.

4.17.7 Wildlife and Fisheries

The AOI for wildlife resources is determined by range of wildlife and BLM stipulations protecting species from project related impacts. Big game species have an AOI based on the WGFD herd units. Greater sage-grouse have an AOI of a two-mile buffer around the project area. Raptors would have an AOI that includes a one-mile buffer around the project. Other smaller wildlife species would have an AOI of only the project area.

The short-term cumulative impacts to wildlife would include disruption of wildlife during development and operation of CBNG operations. This disruption would include displacement of wildlife, loss of some habitat, and greater access to the JRPA. For instance, the construction phase of the project would involve greater disturbance and more human activity.

The cumulative impacts from the current and proposed development in the JRPA, has the potential to impact big game (antelope, deer, elk) in the long-term. The combination of habitat being converted to CBNG facilities and the human disturbance factor (noise and vehicles) has the potential to displace big game species. The development occurring under the interim development plan can not occur where two big game crucial winter ranges overlap. The JRPA contains only 1.8 acres of crucial elk winter range in the extreme southeast corner of Section 9. Deer and antelope utilize the JRPA for winter/yearlong range. Cumulative impacts to big game resulting from this project are minimal and no long-term damage to crucial winter range would occur. However, long-term displacement of big game may occur as additional natural gas development (other than JRPA) occurs in the ARPA.

Impacts to greater sage-grouse should be mitigated through BLM seasonal stipulations. A total of ten active leks, three inactive leks, and six leks of unknown status are located on and within two miles of the JRPA and sales pipeline. The impacts associated with this project, plus other impacts such as increased noise, vehicle traffic, range improvement projects, and prolonged drought can result in additional cumulative impacts to greater sage-grouse in the JRPA and adjacent lands. These impacts when measured together could disrupt lek activity and displace nesting birds.

Surveys identified two active raptor nests within one mile of the sales pipeline and one inactive nest within the JRPA. Cumulative impacts to raptors should be mitigated by BLM seasonal restrictions which prevent activity within one mile of raptor nests. Additional noise and human disturbance associated with this project, and increased use of the area in the future, could displace nesting raptors.

Several BLM sensitive species may occur within the JRPA. Cumulative impacts to these species should be minimized by the small scale of the project, as only 57.7 acres of permanent disturbance would occur as a result of the project.

4.17.8 Recreation

The AOI for recreational resources would include the JRPA and a one mile buffer around the area. This buffer is considered because of the hunting activity and the potential displacement of this group from this area.

Overall, cumulative impacts to recreational use in the JRPA would consist primarily of the displacement of hunters. This would mostly occur during the construction and drilling phase of the project. Additionally, in the long-term some hunters may abandon the area and relocate to an area not impacted by natural gas development. Long-term loss of the hunting activity should be absorbed by the large tracks of public land located in Carbon County. However, most of the disturbance to hunting activity should be short-term and, if big game herds are abundant, hunters would continue utilizing the area.

4.17.9 Visual Resources

The AOI for visual resources would be areas in the visual range of the JRPA. This can vary, and may include areas up to two miles from the project.

Existing visual qualities in the area have already been affected by natural gas development, including road construction and well development. Proposed and reasonable foreseeable development would add to visual impacts in the JRPA. These conditions increase the likelihood that visitors would be dissatisfied with the landscape.

The cumulative impact of the 24 wells on the visual resources would still be consistent with the BLM VRM Class III designation. This designation would not be impacted as the BMPs described in this chapter would mitigate some of the visual impacts associated with this natural gas development.

4.17.10 Cultural Resources

The AOI for cultural resources is the JRPA.

Federal regulations (Section 106 etc.) require that cultural resources are protected from adverse impacts. The BLM requires that all natural gas projects conduct a Class III cultural resource survey before construction can start. Identification of these sites ensures the proper mitigation measure (avoidance or recovery) can be implemented to protect these resources. Cumulative impacts are avoided through the use of these measures. Additionally, the cultural resource data recovered during natural gas projects increases the knowledge of cultural history.

4.17.11 Socioeconomics

The AOI for socioeconomics is Carbon County, and includes the communities of Rawlins and Baggs.

Increased natural gas development in Carbon County would increase the cumulative impacts to housing and social services in the county. However, the small scale of this project should not stress the county housing and services. This project would be completed before the ARPA is fully developed after issuance of the Atlantic EIS Record of Decision. Additionally, the staff working in the Doty Mountain and Red Rim projects would likely work on this project in late 2004 and early 2005. This means the project would not require that new workers be brought into the area to complete the project. A total of 16-36 full-time workers would be employed during the construction and drilling phase of the project.

The displacement of hunters, particularly those guided by outfitters could cumulatively impact this part of the Carbon County economy. Hunting revenue represents a significant part of the economy during the fall. If hunters and outfitters are displaced from JRPA development, they could relocate to another part of Wyoming not affected by natural gas activity.

Overall, the current natural gas activity represents an important source of government revenue, employment, and retail sales. This is a beneficial cumulative impact of increasing natural gas development in Carbon County.

4.17.12 Transportation

The AOI for transportation is the I-80 corridor in Carbon County and access roads to the JRPA.

CBNG development in the JRPA would increase traffic on I-80 and access roads. However, these roads would be able to handle the increased traffic and no change to the level of service would occur.

With the increase in traffic on Twentymile Road, long-term maintenance requirements may increase. However, these costs would be offset by the increased county revenue received from the project.

4.17.13 Health and Safety

The AOI for health and safety would be the JRPA.

A potential exists for increased risks to workers and the public resulting from natural gas development activities and increased traffic. This increased risk would primarily occur during the construction and drilling phase of the project, when most of the activity would occur in the JRPA. These impacts would be short-term and minimal because of the small scale of the development.

4.17.14 Hazardous Materials

The AOI for hazardous materials is the JRPA.

Cumulative impacts for hazardous materials would result from potential contamination of the area resulting from project activities. This impact is minimized through adherence to the strict BLM guidelines for the storage and handling of hazardous materials. Additionally, these guidelines require that if stored on site, and a spill occurs, it must be cleaned up immediately and the BLM notified. It is not expected that any hazardous substances will be stored on-site, although small quantities of fuel and oil may be kept on-site.

4.17.15 Noise

The AOI for noise would be the JRPA.

Increased noise would result from the construction activities and during operations, particularly the compressor site. This introduction of noise has the potential in the short-term to displace wildlife, particularly greater sage-grouse and big game. In the long-term, if anthropogenic sources of noise do not exceed 10 dBA above natural ambient or background noises measured at an occupied lek, then wildlife may become acclimated to the noise and return to normal activity in the area. This may be obtained through the use of mufflers or other proven methods to reduce or baffle sound placed on compressors and noise producing facilities.